Appendix E

Environmental Management Site Cleanup Summaries

Appendix E presents eight of the Department of Energy's (DOE's) Operations/Field Office summaries that were not presented in Chapter 3. Each summary contains a discussion of the Office of Environmental Management (EM) mission managed by the Operation/Field Office. The discussion is broken into five sections: a general overview; a discussion of end state assumptions; the cost and completion dates for the sites and projects; a work scope summary; and the critical closure paths and programmatic risks of the strategy managed under the Operations/Field Office.

Included as part of each work scope summary is a "Conceptual Summary Disposition Map." These maps show a summary of each office's current conceptual life-cycle approaches for managing EM wastes, nuclear materials, and contaminated media–from their current status, through storage, treatment, and disposal–to achieve the assumed site end states described in the relevant site strategy. In some cases, these conceptual approaches include shipping and off-site treatment and disposal. The Conceptual Summary Disposition Maps represent a "roll-up" from site-, waste-, material-, and media-specific maps. Volumes are approximate and have been rounded to two significant figures. The maps represent data approved as of February 1998. Since then, EM has carried out an effort to reconcile discrepancies and improve data quality. Although these improvements will not appear in *Paths to Closure* until the next update, they are reflected in the current "working" data set that EM continually updates as sites make changes.

The EM site cleanup summaries are presented in the following order:

- Albuquerque Operations Office
- Carlsbad Area Office
- Chicago Operations Office
- Idaho Operations Office
- Nevada Operations Office
- Oak Ridge Operations Office
- Oakland Operations Office
- Ohio Field Office

Additional information on all of the Operations/Field Offices can be found in the site versions of *Paths to Closure* and other supporting documents.

Conceptual Summary Disposition Maps compile information for the sites that report through the Operations or Field Offices. The maps do not reflect Headquarters-directed or national-level strategies for each site, Operations Office, or Field Office. Within each map, activities are organized into "streams," which are defined as groups of materials, media, or wastes having similar origins, management requirements, or barriers to disposition. The following seven waste, material, and media categories are depicted in the maps:

- High-level waste (HLW)
- Transuranic waste (TRU)
- Mixed low-level waste (MLLW)
- Low-level waste (LLW)
- Environmental restoration activities (ER)
- Spent nuclear fuel (SNF)
- Nuclear materials

As has always been the case for this planning effort (reflected in December 1996 and October 1997 guidance to sites) implementation of each element of the EM program is contingent upon the completion of whatever evaluation is required under the National Environmental Policy Act (NEPA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or other statutes.

Decisions that remain to be made include those resulting from two DOE Environmental Impact Statements (EISs). Decisions on disposition of certain nuclear materials will be made pursuant to the Department's *Management of Certain Plutonium Bearing Residues and Scrub Alloys at the Rocky Flats Environmental Technology Site Environmental Impact Statement*. Until these decisions are made, the Conceptual Summary Disposition Maps reflect the "to be decided" (or "TBD") status of those materials.

Decisions on five waste types have been or will be made pursuant to the Department's May 1997 *Final Waste Management Programmatic Environmental Impact Statement* (WM PEIS). This nationwide NEPA analysis examined the potential environmental impacts of managing more than 2 million cubic meters of wastes from past, present, and future DOE activities. The Final WM PEIS identified preferred alternatives for transuranic waste treatment and storage, high-level waste storage, and hazardous waste treatment. The Department has identified preferred management strategies for mixed low-level waste treatment and disposal and low-level waste treatment and disposal. Preferred sites for these management activities have not yet been identified. In

this appendix, assumptions regarding low-level and mixed low-level wastes are subject to change based on future Records of Decision (RODs). The Department has committed to publicly identify its preferred sites at least 30 days prior to issuing any ROD for these two waste streams. As of February 1998, one ROD has been issued from the WM PEIS process for transuranic waste treatment and storage. The Conceptual Summary Disposition Maps show specific disposition of transuranic waste, consistent with this ROD.

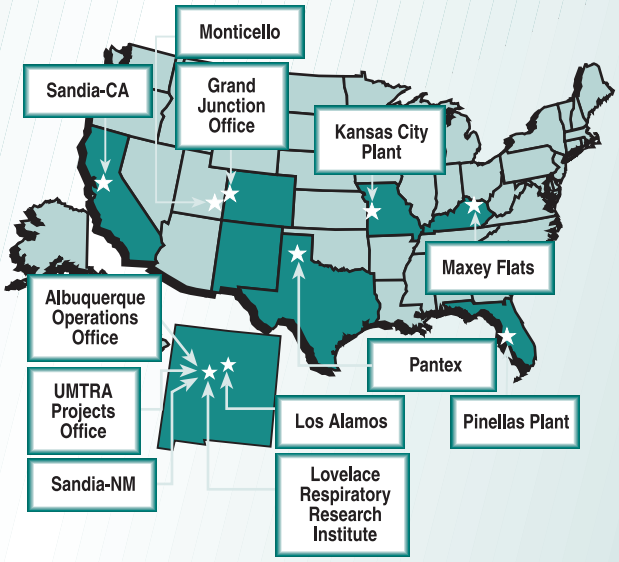
The Conceptual Summary Disposition Maps' depiction of environmental restoration activities differ from other waste or material management activities. Disposition paths for environmental restoration activities begin with "Contaminated Media" and show a "Response Strategy" for the media. Those strategies may or may not be based on decisions regarding environmental restoration wastes resulting from the CERCLA, NEPA, and Resource Conservation and Recovery Act (RCRA) processes. Where such decisions have not yet been made, environmental restoration planning was based upon assumptions that are being evaluated under CERCLA, NEPA, and/or RCRA, and may change as more media characterization data become available, as comments are received from local stakeholders through public involvement processes, or as the regulatory agencies review and evaluate the various cleanup alternatives.

E.1 Albuquerque Operations Office Summary

The Albuquerque Operations Office is located on Kirtland Air Force Base, directly south of the City of Albuquerque, New Mexico. Historically, the Albuquerque Operations Office's primary mission had been to manage sites that were involved in research, development, production, and maintenance of nuclear weapons. In recent years, this mission has evolved to include environmental management, science and technology, technology transfer and commercialization, and national energy objectives.

Albuquerque Operations Office

The Albuquerque Operations Office provides oversight for environmental management activities to the following sites: the Lovelace Respiratory Research Institute (formerly the Inhalation Toxicology Research Institute); the Los Alamos National Laboratory; the Sandia National Laboratories in New Mexico and California; the South Valley Superfund Site; the Kansas City Plant; the Grand Junction Office; the Pantex Plant; Maxey Flats; the Pinellas Plant; the Monticello Millsite; and uranium mill tailings sites.



The ***Lovelace Respiratory Research Institute*** (formerly the Inhalation Toxicology Research Institute) was established in 1960 to conduct research on the human health consequences of inhaling airborne radioactive materials. Beginning in the 1980s, the program shifted to more basic research on the human respiratory tract and its response to inhaled toxicants.

Los Alamos National Laboratory was established in 1943 to design, develop, and test nuclear weapons. Research programs in nuclear physics, hydrodynamics, conventional explosives, chemistry, metallurgy, radiochemistry, and life sciences supported this mission. In addition to research, an important function of the Laboratory has been processing plutonium metal and alloys from nitrate solution feedstock provided by other production facilities. Processing plutonium metal took place from 1945 to 1978. Other operations included reprocessing nuclear fuel, processing polonium and actinium, and producing nuclear weapons components.

The ***Sandia National Laboratories*** were established in the 1940s as the engineering arm of the nuclear weapon development program. Sandia National Laboratories - New Mexico is a multi-program national laboratory with research and development programs in a broad range of scientific and technical fields, including fundamental energy research, energy conservation and renewable energy, nuclear reactor safety and reliability, nuclear waste management, and magnetic-confinement fusion. Sandia National Laboratories - California was established in 1956 to conduct research and development in the interest of national security, with principal emphasis on nuclear weapons development and engineering, excluding nuclear materials. It enabled a close working relationship with Lawrence Livermore National Laboratory.

The ***Kansas City Plant*** was constructed in 1942 to build aircraft engines for the Navy. After World War II, it was used for storage, and in 1949 it was selected for its current mission, the manufacturing of nonnuclear components for nuclear weapons. Electrical, electromechanical, mechanical, and plastic components are manufactured or procured by this facility.

Maxey Flats was opened under a lease arrangement between the Commonwealth of Kentucky and the Nuclear Engineering Company (now U.S. Ecology, Inc.) of Louisville, Kentucky in January 1963. The site contains long-lived radionuclides brought to the site from research laboratories, electric utilities, government and private health care facilities, manufacturing companies, and nuclear powerplants throughout the United States. The Department of Energy (DOE) has no management responsibilities for the cleanup of this site, but pays a share of the costs.

The ***Pantex Plant*** was built by the United States Army in 1942 as a conventional bomb plant. The mission of the Pantex Plant involves fabricating high explosives for nuclear weapons, assembling nuclear weapons, maintaining and evaluating nuclear weapons in the stockpile, and dismantling nuclear weapons as they are retired from the stockpile. At present, the principal operation is the disassembly of nuclear weapons.

The ***Pinellas Plant*** has been part of the DOE's nuclear weapons complex since 1957. The plant's former mission was component fabrication. In September 1994, the plant stopped producing weapons-related components and began the transition from a defense mission to an environmental management mission. In 1997 this facility was closed and transferred to Pinellas County.

Grand Junction Office was established in 1943 under the Manhattan Engineer District. Between 1943 and 1946, the U.S. Vanadium Corporation constructed and operated a uranium refinery for the federal government at the site. As a result of past uranium-related activities, surface and near-surface soils, buildings (wood, concrete/brick and metal), and related equipment were contaminated with uranium mill tailings and ore. In addition to the cleanup of this contamination, the Grand Junction Office also serves as a central office for managing long-term surveillance and monitoring at some DOE sites.

Monticello Millsite and Vicinity Properties were transferred to the Department of Energy's Environmental Management (EM) program in 1987 for the remediation of contamination caused by past vanadium and uranium milling at the millsite. The Grand Junction Office is responsible for managing the cleanup activities at the Monticello Millsite.

The ***Uranium Mill Tailings Remedial Action (UMTRA) Surface Projects and UMTRA Groundwater Projects*** manage the implementation of the Uranium Mill Tailing Radiation Control Act (UMTRCA). The United States Congress passed the UMTRCA in 1978 in response to public concern regarding potential health hazards of long-term exposure to radiation from uranium mill tailings. The Act authorized DOE to stabilize, dispose of, and control uranium mill tailings and other contaminated material at 24 uranium mill processing sites and approximately 5,200 associated vicinity properties. The 24 UMTRA sites include: Ambrosia Lake (New Mexico), Belfield (North Dakota), Bowman (North Dakota), Canonsburg (Pennsylvania), Durango (Colorado), Falls City (Texas), Grand Junction (Colorado), Green River (Utah), Gunnison (Colorado), Lakeview (Oregon), Lowman (Idaho), Maybell (Colorado), Mexican Hat (Utah), Monument Valley (Arizona), Naturita (Colorado), New Rifle (Colorado), Old Rifle (Colorado), Riverton (Wyoming), Salt Lake City (Utah), Shiprock (New Mexico), Slick Rock - Old North Continent (Colorado), Slick Rock - Union Carbide (Colorado), Spook (Wyoming), and Tuba City (Arizona).

E.1.1 End State

The Albuquerque Operations Office planned end states for each site at completion are compliance-based and can be achieved with currently available technology. Therefore, they are not likely to be modified as new technologies become available. While economics are likely to affect schedules, the Albuquerque Operations Office does not expect economic feasibility issues to affect planned end states significantly. Unanticipated new regulatory requirements have the greatest potential to change the planned end states at Albuquerque Operations Office sites.

The landlord programs at non-EM sites will have responsibility for determining future use and final end state at the completion of EM activities. Facilities being decontaminated or decommissioned under EM programs will revert to landlord control upon completion. Plans call for EM control of active waste management facilities to be transferred to the generator or landlord program by 1999. While EM activities will terminate, these facilities will continue to operate with the final end state to be determined by the landlord program. Also, at these sites, DOE will maintain stewardship and overall land use will likely continue as is for the foreseeable future. Exhibit E-1 provides a summary of the anticipated end states for sites managed by the Albuquerque Operations Office.

Exhibit E-1
Summary of Albuquerque Operations Office End States

Site Name	End State Description
Ambrosia Lake (completed UMTRA site)	A Nuclear Regulatory Commission (NRC)-licensed disposal cell with a radon barrier cover and surface layer of rock rip-rap for erosion control will remain on site. Under the provisions of the UMTRCA, public access to the disposal cell will be restricted but future land use at the site is undetermined.
Belfield, Bowman (UMTRA sites)	At the request of the State of North Dakota, the Department has revoked the designation of these two sites under UMTRCA. As a result of the revocation, these sites will no longer require remediation under the UMTRCA and DOE will have no long-term stewardship requirements.
Canonsburg, Falls City, Green River, Lakeview, Lowman, Shiprock, Spook (all completed UMTRA sites), Maybell (UMTRA site)	A NRC-licensed disposal cell will remain at each site. Under the provisions of the UMTRCA, public access to the disposal cell will be restricted but future land use at each site is undetermined. Active groundwater remediation is not planned at this time.
Durango, Grand Junction/Cheney Cell (UMTRA sites)	The tailings have been disposed of in off-site disposal cells licensed by the NRC. Under the provisions of the UMTRCA, public access will be restricted but future land use at each site is undetermined. Site assumptions are that groundwater will undergo natural attenuation until the site meets EPA standards.
Grand Junction Office	Under the Grand Junction Office Remedial Action Project (GJORAP), all radiological contamination will be either removed and disposed of off site or the use of supplemental limits (SL) will be selectively applied and approved. The significantly contaminated buildings will be decontaminated or demolished and the remainder of the contaminated buildings will undergo application and approval of SL so that the entire site can be released for unrestricted use. The remaining land and buildings will be transferred to private or other use, with no restrictions. Administrative control of groundwater will continue until it is verified that passive remediation has achieved cleanup goals.
Gunnison (completed UMTRA site)	All contaminated surface materials have been removed from the site and stabilized in a disposal cell licensed by the NRC. Site assumptions are that groundwater will undergo natural attenuation until the site meets EPA standards.

Exhibit E-1 (Continued)

Site Name	End State Description
Lovelace Respiratory Research Institute (LRRI)	This site was cleaned to industrial standards and closed in 1996 with neither surveillance nor monitoring activities required. Contaminated soil was shipped off site, but groundwater contamination exceeds the cleanup level of 10 mg/l set by the New Mexico Environmental Department. Natural attenuation of the nitrates is expected to reduce groundwater contamination levels below the cleanup standard. LRRI is located on land which the U.S. Air Force leases to DOE. DOE's Office of Energy Research is the current operational landlord and will likely make future mission and end state decisions. LRRI will continue to manage DOE generated waste as long as a DOE mission continues.
Kansas City Plant	Soil contamination will be contained or removed by the end of FY 1998. Groundwater contamination, primarily dense non-aqueous phase liquids, will be cleaned up primarily through the use of innovative technologies; however, final contaminant levels are undecided. Groundwater treatment and monitoring is expected to continue from as little as two years to potentially hundreds of years, depending on the outcome of the ongoing negotiations between DOE and EPA. Future land use is expected to be commercial. Defense Programs is the landlord.
Los Alamos National Laboratory	Los Alamos has an ongoing research mission. Legacy mixed low-level waste will be sent off site by 2004. Decommissioning and decontamination of the two on-site TRU reduction and repackaging facilities will be complete by FY 2017. The site will maintain most of its 43 square mile property but is considering transfer of up to 7,000 acres to the county for industrial use. Land and facilities that DOE will retain will be remediated to allow for industrial use. The land that has been released or is scheduled to be released will be remediated to allow for unrestricted use. The Los Alamos environmental restoration project will be complete by 2008.
Maxey Flats Disposal Site	In accordance with the CERCLA ROD, planned cleanup levels will result in natural stabilization with waste remaining on site. DOE has no control or management responsibility. There is no further DOE liability after DOE makes its final payment, currently scheduled for 2001. The Commonwealth of Kentucky is responsible for long-term stewardship. The site will remain a permanent low-level waste disposal site, and will be under controlled access.

Exhibit E-1 (Continued)

Site Name	End State Description
Monticello Millsite & Vicinity Properties	DOE-owned land on the mill site is expected to be deeded to the City of Monticello for recreational use. The Monticello Mill Tailings Site and the Monticello Vicinity Properties Site will be remediated to the radium-226 standards established in 40 CFR 192. Tailings and tailings-contaminated soil will be excavated and placed in a permanent repository on DOE-owned property. A cover will be placed over the tailings to control radon emissions, infiltration of precipitation, and erosion. EPA and the State have approved supplemental standards, with some qualifications, for some vicinity and peripheral properties. Areas that meet radium-226 standards will be released for unrestricted use. Final land use restrictions for other areas are being determined by DOE, EPA, and the State. The on-site repository will remain under DOE control. The remedy for contaminated sediment, surface water, and groundwater has not yet been selected.
Monument Valley (completed UMTRA site)	Surface materials have been shipped to the Mexican Hat UMTRA site for disposal. Site assumptions are that groundwater at Monument Valley will undergo active remediation through 2010 in order to meet EPA groundwater standards.
Naturita (UMTRA site)	All buildings at the site have been demolished. Residual radioactive surface materials have been transported to the Uravan disposal site and disposed of in a disposal cell at the Upper Burbank Repository. Site assumptions are that groundwater will undergo natural attenuation until the site meets EPA standards.
New Rifle Site, Old Rifle Site (UMTRA sites)	Surface materials have been excavated, transported, and disposed of at the Estes Gulch disposal cell. Groundwater will undergo natural attenuation until the site meets EPA standards. It is expected that the State of Colorado will transfer ownership to the city or county for public use with restrictions; this will allow DOE access to continue the UMTRA groundwater project.
Pantex Plant	Site closure under the Environmental Management program is not anticipated in the foreseeable future. As a result, facility decontamination and decommissioning and future land use are not addressed in *Paths to Closure*. Current land use (industrial) will remain unchanged. Waste management operations will continue in support of the site's ongoing mission. Legacy waste will be dispositioned by FY 2004. All currently identified release sites will be remediated to achieve closure designation in accordance with cleanup levels contained in the Texas Risk Reduction Standards Guidance. Groundwater pump and treat operations will continue until FY 2015. However, long-term efficiency and capability of the groundwater extraction and treatment system to capture the contaminant plume is uncertain, and additional time could be required to fully achieve groundwater remediation objectives.

Exhibit E-1 (Continued)

Site Name	End State Description
Pinellas Plant	This site was sold to Pinellas County Industrial Council (PCIC) in FY 1995, and DOE completed surface remediation in FY 1997. Pinellas' liability under CERCLA for former off-site waste disposal was transferred to the Grand Junction Office as of October 1997. The site will require treatment of contaminated groundwater where high levels of groundwater contamination exist to meet the "industrial with unrestricted access" classification. Groundwater will be cleaned to Clean Water Act maximum contaminant levels. When site groundwater is remediated to the specified level, DOE's responsibility will be terminated.
Riverton (completed UMTRA site)	Site assumptions are that groundwater at Riverton has been determined a non-drinking water source and will undergo natural attenuation until the site meets EPA standards (up to 100 years).
Salt Lake City (completed UMTRA site)	Tailings have been shipped off site for disposal. The site remains under private control. Current planning is that Clean Water Act alternate concentration limits will be accepted for achieving groundwater compliance.
Sandia National Laboratories - California	Sandia will have an ongoing mission under the responsibility of the Office of Defense Programs. The Sandia Environmental Restoration Project intends to complete remediation and associated waste disposal for all 23 release sites by 1999. All designated solid waste management units and areas of concern will be remediated or placed under management controls such that no further action is necessary. The Environmental Restoration Project is planning to close the Navy Landfill in 1998.
Sandia National Laboratories - New Mexico	This site will have an ongoing mission under the responsibility of the Office of Defense Programs. All identified environmental restoration sites will have been remediated and associated waste disposed of in a Corrective Action Management Unit (CAMU) disposal cell or at an off-site location. All 183 sites except the chemical waste landfill, mixed waste landfill, and the CAMU disposal cell will be released for reapplication by Defense Programs. By 2001 disposal of all historical waste, waste generated within permit regulatory limits, and closure of excess waste management facilities will be complete. Nearly all of the land is expected to be available for reapplication for DOE/SNL programmatic uses (industrial) beginning in 2001, with security safeguards remaining in place. Some future land use may include recreational activities, although there will be controlled access for the landfills and CAMU.

Exhibit E-1 (Continued)

Site Name	End State Description
Slick Rock - Old North Continent and Union Carbide (completed UMTRA sites)	A NRC-licensed disposal cell with a radon barrier cover and surface layer of rock rip-rap for erosion control has been constructed at an off-site location. Under the provisions of the UMTRCA, public access to the disposal cell will be restricted, but future land use at the site is undetermined. Tailings from both sites have been relocated to an off-site disposal cell. Site assumptions are that groundwater at Old North Continent and Union Carbide has been determined a non-drinking water source and will undergo natural attenuation until the site meets EPA standards (up to 100 years). Albuquerque Operations Office assumes that NRC will complete licensing review by 1999. The sites will be returned to their owners upon NRC certification of compliance with Subpart B of the EPA groundwater protection standards.
South Valley Superfund Site	The surface remediation of this site was completed in 1996. Groundwater contamination continues to threaten local drinking water supplies and private wells. Remediation includes removing the contamination from the groundwater and preventing migration of contamination. Groundwater remediation will take place until eight consecutive groundwater samples indicate all cleanup levels have been achieved or a waiver of technical impracticability is approved by the EPA. DOE, the U.S. Air Force, and General Electric entered into a settlement agreement to reimburse General Electric for environmental restoration services performed at the site.
Tuba City (completed UMTRA site)	A NRC-licensed disposal cell with a radon barrier cover and surface layer of rock rip-rap for erosion control will remain on site. Under the provisions of the UMTRCA, public access to the disposal cell will be restricted. Site assumptions are that groundwater at Tuba City will undergo active remediation through 2010 or beyond in order to meet EPA groundwater standards.

E.1.2 Cost and Completion Dates

The Albuquerque Operations Office has divided its environmental management work into 20 discrete projects including the two Uranium Mill Tailings Remedial Action (UMTRA) projects (one for surface tailings and one for groundwater.) A Project Baseline Summary (PBS) exists for each project and contains detailed information, including cost, schedule, scope, end state, and interim milestones. A summary of the Albuquerque cost and schedule information is illustrated in Exhibit E-2. For additional information about these projects, refer to individual PBSs.